

EMC Test Report

For

Guangdong Liangyueliang Photoelectric Technology Co.,Ltd

Ballast

**MODEL NO: RH9-2100-320,LYL-800-24W,LYL-800-36W,LYL800-40W,LYL-800-55W,
LYL-800-75W,LYL-800-100W,LYL-800-120W,LYL-800-150W,
LYL-800-165W,LYL-800-180W,LYL-800-200W,PH2-800-24W,
PH2-800-36W,PH2-800-40W,PH2-800-55W,PH2-800-75W,PH2-800-100W,
PH2-800-120W,PH2-800-150W,PH2-800-165W,PH2-800-180W,
PH2-800-200W,LYL-DZL-60W,LYL-425-17W,PL1-425-90W,
LYL1-425-90W,PL1-800-100,LYL1-800-100,PL11-425-40W,PL1-425-40W,
LYL1-425-40W,LYL-SL-511,LYL-LL-630,LYL-Y2-800-150W,
DHZ-900-180W,LYL-Y2-800-150W,LYL-Y2-800-150-II,LYL800-80-150W,
220V-7W,XR2-800-2-75U,LYL-Y2-800-150W,LYL-Y7-800-150W,
LYL-5W,LYL-7W,LYL-9W,LYL-11W,LYL-13W,BS-ZSZ8-20E,
LYLP-425-55W,PL1-425-40W,PL1-425-90W,PL1-800-100W,
PL11-425-40W,LYL-900-180W,LYL-4W,LYL-6W,LYL-8W,LYL-10W,
LYL-15W,LYL-40W**

Prepared For : Guangdong Liangyueliang Photoelectric Technology Co.,Ltd
The 3rd Storey of Block No 2 in ShaChongWei Area,
XiaoTangXinJing Village, ShiShan Town, NanHai District, Foshan
City, China

Prepared By : Beide (Shenzhen) Product Service Limited

China: 6F, Bldg E, Hourui 3rd Ind Zone, Xixiang, Bao'an Dist,
Shenzhen, China

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TEST REPORT DECLARATION

Applicant : Guangdong Liangyueliang Photoelectric Technology Co.,Ltd
Address : The 3rd Storey of Block No 2 in ShaChongWei Area,
XiaoTangXinJing Village, ShiShan Town, NanHai District,
Foshan City, China
Client No. : 0757A491
Manufacturer : Same As Holder
Trademark : 
EUT Description : Ballast
Model No. : See Page1
Remark : Use LYL-Y7-800-150W to do all tests.
Technical Data : Input: 230V~,50/60Hz,150W
Output:230V~,0.7A

Test Procedure Used:

EN 55015:2013+A1:2015;
EN IEC 61000-3-2:2019; EN 61000-3-3:2013+A1:2019;
EN 61547:2009 (EN 61000-4-2:2009, EN 61000-4-3:2006+A2:2010
EN 61000-4-4:2012, EN 61000-4-5:2014,
EN 61000-4-6:2014, EN 61000-4-8:2010, EN 61000-4-11:2004)

The device described above is tested by Beide (Shenzhen) Product Service Limited to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and EUT's performance criterion. The test results are contained in this test report. Beide (Shenzhen) Product Service Limited is assumed of full responsibility for the accuracy and completeness of these tests.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Beide (Shenzhen) Product Service Limited.

Date of Test : May 21-27,2020

Prepared by : Sophia jiang
(Sophia jiang)

Checked by : Austin zhong
(Austin zhong)

Approved by : Martin wang
(Martin wang)



1.TEST RESULTS SUMMARY

Test Results Summary

Test Items	Test Results
1 Power Line Conducted Emission Test	PASS
2 Radiation Emission Test	PASS
3 Magnetic Test	PASS
4 Harmonic Current Test	PASS
5 Voltage Fluctuations & Flicker Test	PASS
6 Electrostatic Discharge Test	PASS
7 Radio Frequency Electromagnetic Fields	PASS
8 Electrical Fast Transient/Burst Test	PASS
9 Surge Test	PASS
10 Injected Currents Susceptibility Test	PASS
11 Magnetic Field Immunity Test	PASS
12 Voltage Dips And Interruptions Test	PASS

Beide

2.GENERAL INFORMATION

2.1.Report Information

2.1.1. This report is not a certificate of quality, it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that BEIDE approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that BEIDE in any way guarantees the later performance of the product/equipment.

2.1.2. The sample/s mentioned in this report is/are supplied by applicant, BEIDE therefore assumes no responsibility for the accuracy of information on the brand names, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the applicant at an additional fee. No third part can obtain a copy of this report through BEIDE, unless the applicant has authorized BEIDE in writing to do so.

2.2.Description of Device (EUT)

Description : Ballast

Model Number : LYL-Y7-800-150W

Applicant : Guangdong Liangyueliang Photoelectric Technology Co.,Ltd
Address : The 3rd Storey of Block No 2 in ShaChongWei Area,
XiaoTangXinJing Village, ShiShan Town, NanHai District, Foshan
City, China

Manufacturer : Guangdong Liangyueliang Photoelectric Technology Co.,Ltd
Address : The 3rd Storey of Block No 2 in ShaChongWei Area,
XiaoTangXinJing Village, ShiShan Town, NanHai District, Foshan
City, China

2.3.Test Facility

Site Description

EMC Lab. : Beide (Shenzhen) Product Service Limited
Site Location : 6F, Bldg E, Hourui 3rd Ind Zone, Xixiang, Bao'an Dist, Shenzhen,
China

2.4.Test Condition

Test Mode: ON

2.5. Test Conditions

Temperature: 22°C-28°C

Relative Humidity: 45%-68%

2.6. Performance Criterion

Performance criterion **A**:

The equipment shall continue to operate as intended during the test.

No change of actual operating state (for example change of channel) is allowed as a result of the application of the test.

Multifunction equipment shall for each function meet the relevant requirements.

Evaluation is carried out for audio and video functions.

Performance criterion **B**:

The equipment shall continue to operate as intended after the test. No loss of function is allowed after the test when the apparatus is used as intended. But failures which are recovered automatically but which cause temporary delay in processing, are permissible.

No change of actual operating state for example change of channel or stored data and settings is allowed as a result of the application of the test. During the test, degradation of performance is allowed.

3.TEST INSTRUMENT USED

3.1.For Power Line Conducted Emission Test (In Shielding Room)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	E4402B-ES A	US1192821	2019.08.18	1 Year
2.	EMI Test Receiver	ROHDE&SCHWARZ	ESPI	101206	2019.08.18	1Year
3.	L.I.S.N.	SCHWARZBECK	NSLK8126	8126-224	2019.08.18	1Year
4.	L.I.S.N.	EMCO	3825/2	11977C	2019.08.18	1 Year

3.2.For Radiation Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Rohde&schwarz	FSEA20	DE25181	2019.08.18	1 Year
2.	Positioning Controller	C&C	CC-C-1F	N/A	2019.08.18	1 Year
3.	Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-333	2019.08.18	1 Year
4.	Horn Antenna	Schwarzbeck	BBHX9120	9120-426	2019.08.18	1 Year
5.	RF Switch	EM	EMSW18	SW060023	2019.08.18	1 Year
6.	Amplifier	Agilent	8447F	3113A0671 7	2019.08.18	1 Year
7.	Coaxial Cable	Schwarzbeck	AK9513	9513-10	2019.08.18	1 Year
8.	EMI Test Receiver	Rohde&schwarz	ESPI	101206	2019.08.18	1 Year

3.3.For Magnetic Test (In Shielding Room)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	ROHDE&SCHWARZ	ESCS30	100307	2019.08.18	1 Year
2.	Loop Antenna	Laplace Instrument Ltd	RF300	8006	2019.08.18	1 Year
3.	Pulse Limiter	ROHDE&SCHWARZ	ESH3-Z2	100305	2019.08.18	1Year
4.	50Ω Coaxial Switch	ANRITSU CORP	MP59B	6200283933	2019.08.18	1 Year

3.4.For Harmonic / Flicker Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Power frequency test system	HAEFELY	PHF555	080419-03	2019.08.18	1Year
2	PC	N/A	P2L97	N/A	2019.08.18	1Year

3.5.For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	HAEFELY	PESD 1600	H708159	2019.08.18	1 Year

3.6.For Radio Frequency Electromagnetic Fields Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	RF Power Meter Dual Channel	BOONTON	4232A	10539	2019.08.18	1 Year
2.	50ohm Diode Power Sensor	BOONTON	51011EMC	34236/3423 8	2019.08.18	1 Year
3.	Broad-band horn Antenna	SCHWARZB ECK	BBHA9120 L3F	332	2019.08.18	1 Year
4.	Power Amplifier	PRANA		N/A	2019.08.18	1 Year
5.	Power Amplifier	MILMEGA	AS0102-55	N/A	2019.08.18	1 Year
6.	Signal Generator	AEROFLEX	20238	N/A	2019.08.18	1 Year
7.	Field Strength Meter	HOLADAY	HI-6005	N/A	2019.08.18	1 Year
8.	RS232 Fiber optic modem	HOLADAY	HI-4413P	N/A	2019.08.18	1 Year
9.	Log.-per. Antenna	SCHWARZB ECK	VULP9118 E	N/A	2019.08.18	1 Year

3.7.For Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Burst Tester	HAEFELY	PEFT4010	080981-16	2019.08.18	1 Year
2.	Coupling Clamp	HAEFELY	IP-4A	147147	2019.08.18	1 Year

3.8.For Surge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Tester	HAEFELY	PSURGE4.1	080107-04	2019.08.18	1 Year

3.9.For Injected Currents Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Simulator	EMTEST	CWS500C	0900-12	2019.08.18	1 Year
2.	CDN	EMTEST	CDN-M2	5100100100	2019.08.18	1 Year
3.	CDN	EMTEST	CDN-M3	0900-11	2019.08.18	1 Year
4.	Injection Clamp	EMTEST	F-2031-23MM	368	2019.08.18	1 Year
5.	Attenuator	EMTEST	ATT6	0010222A	2019.08.18	1 Year

3.10.For Magnetic Field Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Magnetic Field Tester	HAEFELY	MAG100	250040.1	2019.08.18	1 Year

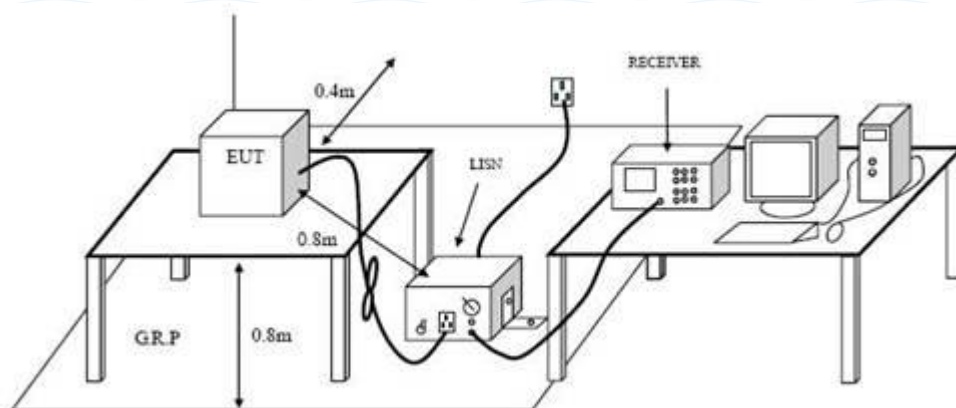
3.11.For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Dips Tester	HAEFELY	Pline1610	083732-12	2019.08.18	1 Year



4. POWER LINE CONDUCTED EMISSION TEST

4.1. Block Diagram of Test Setup



4.2. Test Standard

EN 55015:2013+A1:2015

4.3. Power Line Conducted Emission Limits

Frequency	At mains terminals (dB μ V)	
	Quasi-peak Level	Average Level
9kHz ~ 50kHz	110	--
50kHz ~ 150kHz	90 ~ 80*	--
150kHz ~ 0.5MHz	66 ~ 56*	56 ~ 46*
0.5MHz ~ 2.51MHz	56	46
2.51MHz ~ 3.0MHz	73	63
3.0MHz ~ 5.0MHz	56	46
5.0MHz ~ 30MHz	60	50

1. At the transition frequency the lower limit applies.
2. * decreasing linearly with logarithm of the frequency.

4.4. Operating Condition of EUT

- 4.4.1. Setup the EUT as shown in Section 4.1.
- 4.4.2. Turn on the power of all equipments.
- 4.4.3. Let the EUT work in test mode (ON) and test it.

4.5.EUT Configuration on Test

The EN 55015 Class B regulations test method must be used to find the maximum during power line conducted emission test.

The configuration of EUT is same as used in power line conducted emission test.

4.5.1. Ballast

Model Number : LYL-Y7-800-150W

4.6.Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground and connected to the AC mains through a Line Impedance Stabilization Network (L.I.S.N.). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission according to the EN 55015 regulations during conducted emission test. And the voltage probe had been used for the load terminals test according to the EN 55015 standard.

The bandwidth of the test receiver (R&S ESPI) is set at 10kHz. In 150 kHz~30 MHz and 200Hz bandwidth in 9 kHz~150 kHz.

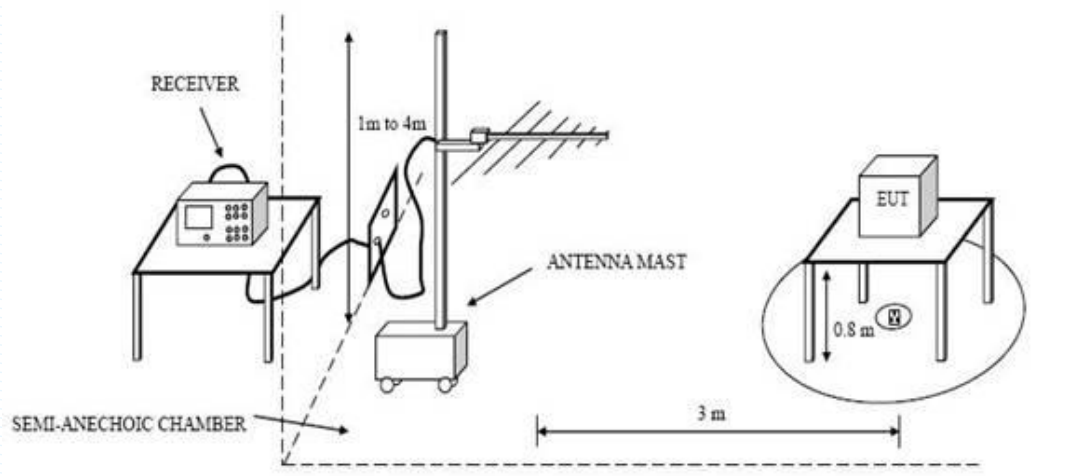
The frequency range from 9 kHz to 30 MHz is checked. The scanning waveform is put in APPENDIX I.

4.7.Power Line Conducted Emission Test Results

PASS.

5. RADIATION EMISSION TEST

5.1. Block Diagram of Test Setup



5.2. Test Standard

EN 55015:2013+A1:2015

5.3. Radiation Emission Limit

All emanations from a Class B computing devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dB μ V/m)
30 ~ 230	3	40
230 ~ 300	3	47

- Notes: 1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

5.4. EUT Configuration on Test

The test Class B regulations test method must be used to find the maximum emission during radiated emission test.

The configuration of EUT is same as used in the test.

5.5. Operating Condition of EUT

- 5.5.1. Setup the EUT as shown on Section 5.1.
- 5.5.2. Turn on the power of all equipments.
- 5.5.3. Let the EUT work in test mode (ON) and measure it and test it.

5.6. Test Procedure

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna (calibrated by dipole antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth setting on the test receiver (R&S TEST RECEIVER ESPI) is 120kHz. The EUT is tested in Anechoic Chamber.

The frequency range from 30 MHz to 300MHz is checked. The scanning waveform is put in APPENDIX I.

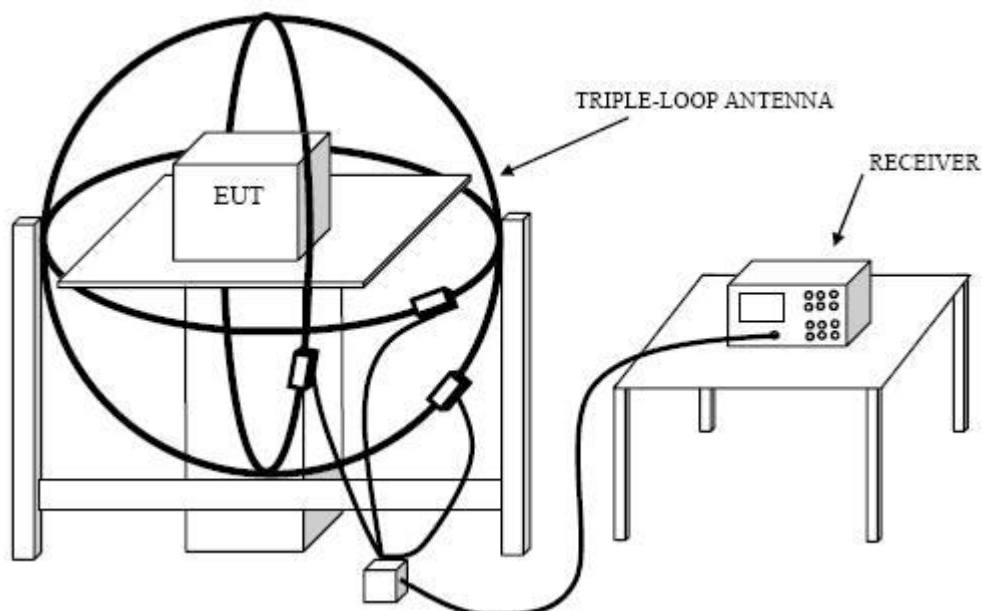
5.7. Radiation Emission Test Results

PASS



6.MAGNETIC TEST

6.1.Block Diagram of Test Setup



6.2.Test Standard

EN 55015:2013+A1:2015

6.3.Magnetic Field Emission Limits

Frequency	Limits for loop diameter (dB μ A)
	2m
9kHz ~ 70kHz	88
70kHz ~ 150kHz	88 ~ 58*
150kHz ~ 2.2MHz	58 ~ 26*
2.2MHz ~ 3.0MHz	58
3.0MHz ~ 30MHz	22

1. At the transition frequency the lower limit applies.
2. * decreasing linearly with logarithm of the frequency.

6.4.EUT Configuration on Test

The EN 55015 Class A regulations test method must be used to find the maximum Magnetic during the test.

The configuration of EUT is same as used in the test.

6.5.Operating Condition of EUT

6.5.1. Setup the EUT and simulators as shown in Section 6.1.

6.5.2. Turn on the power of all equipments.

6.5.3. Let the EUT work in test mode (ON) and test it.

6.6.Test Procedure

The EUT is placed on a wood table in the center of a loop antenna. The induced current in the loop antenna is measured by means of a current probe and the test receiver. Three field components are checked by means of a coax switch.

The frequency range from 9 kHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9 kHz to 150 kHz, the bandwidth of the field strength meter (R&S test receiver ESPI) is set at 200Hz. For frequency band 150 kHz to 30MHz, the bandwidth is set at 10 kHz.

The frequency range from 9 kHz to 30MHz is investigated.

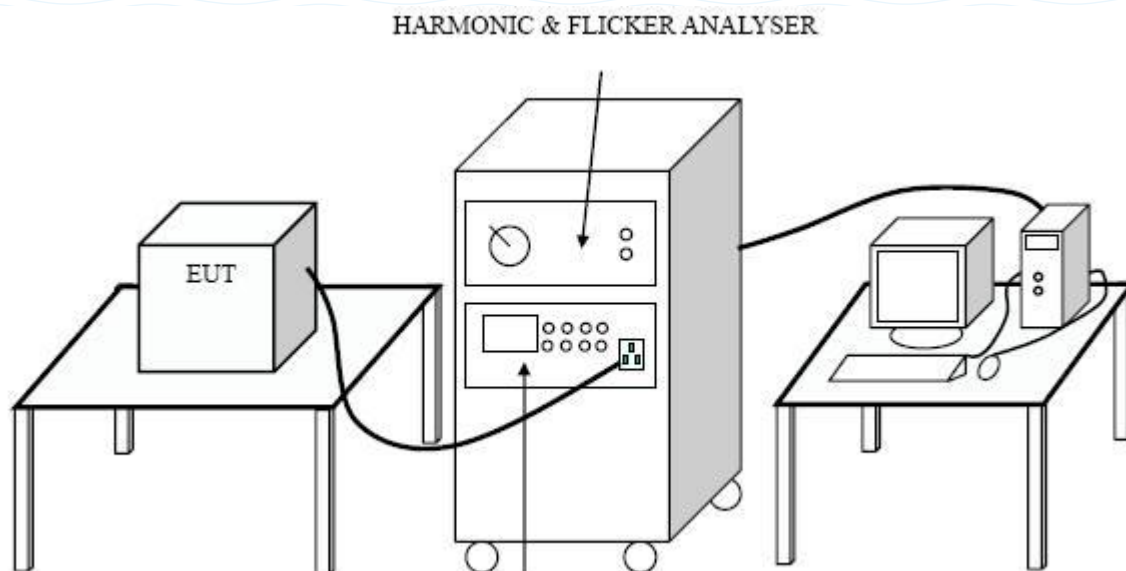
As the peak value is too low against the limit, so the Quasi-peak value has been omitted.

6.7.Magnetic Field Immunity Test Results

PASS.

7.HARMONIC CURRENT TEST

7.1.Block Diagram of Test Setup



7.2.Test Standard

EN IEC 61000-3-2:2019, Class C

7.3.Operating Condition of EUT

- 7.3.1. Setup the EUT as shown in Section 7.1.
- 7.3.2. Turn on the power of all equipments.
- 7.3.3. Let the EUT work in test mode (ON) and test it.

7.4.Test Results

PASS.

Please refer to the following page.

HarmOrder	Limit1(A rms)	Limit2(A rms)	Ave(A rms)	Max(A rms)	LimitOver(s)	Judge
2	0.0049	0.0073	0.0010	0.001	0.0	N/A
3	0.0715	0.1072	0.0232	0.024	0.0	Pass
4	-----	-----	0.0010	0.001	-----	N/A
5	0.0244	0.0366	0.0080	0.008	0.0	Pass
6	-----	-----	0.0010	0.001	-----	N/A
7	0.0171	0.0256	0.0070	0.007	0.0	Pass
8	-----	-----	0.0010	0.001	-----	N/A
9	0.0122	0.0183	0.0050	0.005	0.0	Pass
10	-----	-----	0.0010	0.001	-----	N/A
11	0.0073	0.0110	0.0030	0.004	0.0	N/A
12	-----	-----	0.0010	0.001	-----	N/A
13	0.0073	0.0110	0.0030	0.003	0.0	N/A
14	-----	-----	0.0010	0.001	-----	N/A
15	0.0073	0.0110	0.0022	0.003	0.0	N/A
16	-----	-----	0.0010	0.001	-----	N/A
17	0.0073	0.0110	0.0019	0.002	0.0	N/A
18	-----	-----	0.0015	0.002	-----	N/A
19	0.0073	0.0110	0.0014	0.002	0.0	N/A
20	-----	-----	0.0012	0.003	-----	N/A
21	0.0110	0.0110	0.0010	0.002	0.0	N/A
22	-----	-----	0.0010	0.001	-----	N/A
23	0.0110	0.0110	0.0010	0.001	0.0	N/A
24	-----	-----	0.0010	0.001	-----	N/A
25	0.0110	0.0110	0.0010	0.001	0.0	N/A
26	-----	-----	0.0010	0.001	-----	N/A
27	0.0110	0.0110	0.0010	0.001	0.0	N/A
28	-----	-----	0.0010	0.001	-----	N/A
29	0.0110	0.0110	0.0010	0.001	0.0	N/A
30	-----	-----	0.0010	0.001	-----	N/A
31	0.0110	0.0110	0.0010	0.001	0.0	N/A
32	-----	-----	0.0010	0.001	-----	N/A
33	0.0110	0.0110	0.0010	0.001	0.0	N/A
34	-----	-----	0.0010	0.001	-----	N/A
35	0.0110	0.0110	0.0011	0.002	0.0	N/A
36	-----	-----	0.0010	0.002	-----	N/A
37	0.0110	0.0110	0.0010	0.002	0.0	N/A
38	-----	-----	0.0010	0.001	-----	N/A
39	0.0110	0.0110	0.0010	0.002	0.0	N/A
40	-----	-----	0.0010	0.002	-----	N/A

8.VOLTAGE FLUCTUATIONS & FLICKER TEST

8.1.Block Diagram of Test Setup

Same as Section 7.1.

8.2.Test Standard

EN 61000-3-3:2013+A1:2019

8.3.Operating Condition of EUT

8.3.1. Setup the EUT as shown in Section 8.1.

8.3.2. Turn on the power of all equipments.

8.3.3. Let the EUT work in test mode (ON) and test it.

8.4.Test Results

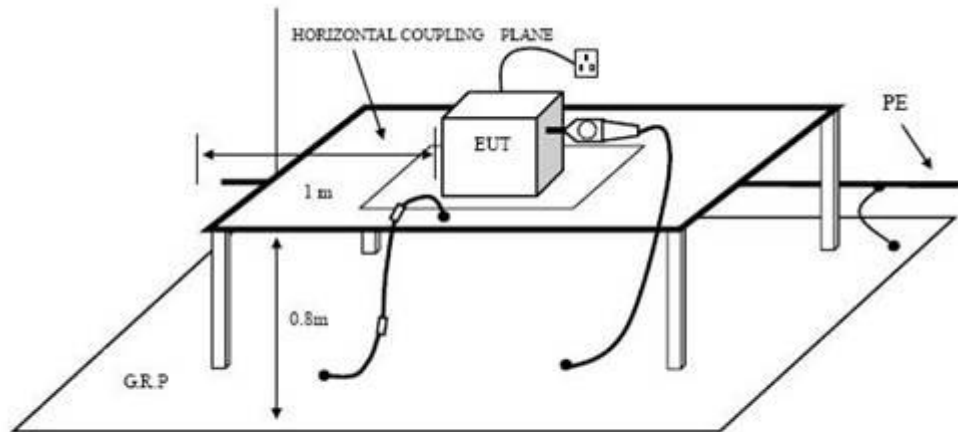
PASS.



9.ELECTROSTATIC DISCHARGE TEST

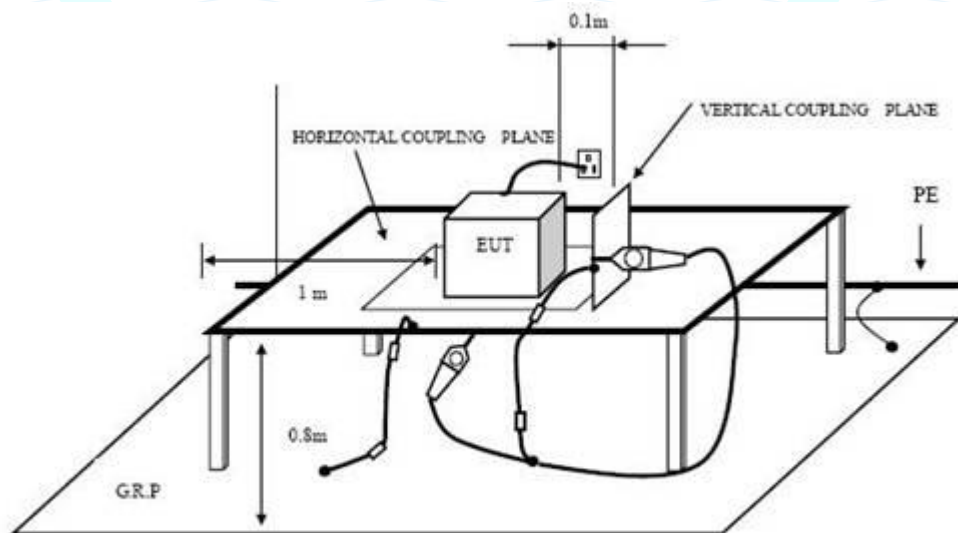
9.1.Block Diagram of Test Setup

9.1.1. Block Diagram of ESD Test Setup (Direct Discharge)



DIRECT DISCHARGE SETUP

9.1.2. Block Diagram of ESD Test Setup (Indirect Discharge)



INDIRECT DISCHARGE SETUP

9.2.Test Standard

EN 61547:2009 (EN 61000-4-2:2009)

Severity Level 3 for Air Discharge at 8kV

Severity Level 2 for Contact Discharge at 4kV

9.3. Severity level and Performance criterion

9.3.1. Severity level

Level	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X.	Special	Special

Performance criterion : **B**

9.4. EUT Configuration on Test

The test must be used to find the contact discharge and air discharge the difference voltage ratio during electrostatic discharge test.

The configuration of EUT is same as used in electrostatic discharge test.

9.5. Operating Condition of EUT

9.5.1. Setup the EUT and simulators as shown in Section 9.1.1. and 9.1.2.

9.5.2. Turn on the power of all equipments.

9.5.3. Let the EUT work in test mode (ON) and test it.

9.6. Test Procedure

9.6.1. Air Discharge:

This test is done on non-conductive surfaces. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT.

After each discharge, the discharge electrode shall be removed from the EUT.

The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

9.6.2. Contact Discharge

All the procedure shall be same as Section 9.6.1. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

9.6.3. Indirect discharge for horizontal coupling plane:

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

9.6.4. Indirect discharge for vertical coupling plane:

At least 20 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m×0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

9.7. Test Results

PASS.

Please refer to the following page.



Beide

Electrostatic Discharge Test Results

Beide (Shenzhen) Product Service Limited

Date: May 25,2020

Applicant	: Guangdong Liangyueliang Photoelectric Technology Co.,Ltd	Test Date	: May 25,2020
EUT	: Ballast	Temperature	: 24°C
M/N	: LYL-Y7-800-150W	Humidity	: 51%
Test Engineer	: Jack	Test Mode	: ON

Air Discharge: $\pm 8\text{kV}$ For each point positive 10 times and negative 10 times discharge.

Contact Discharge: $\pm 4\text{kV}$

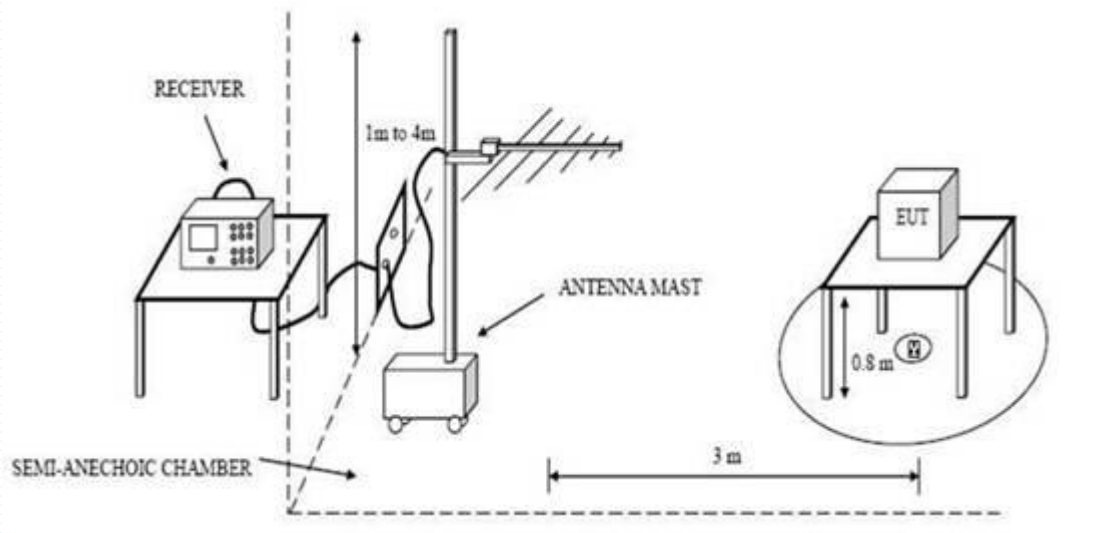
Location		Kind		Result
		A-Air Discharge	C-Contact Discharge	
Surface	20 points	A		PASS
Pin	10 points	C		PASS
HCP	5 points	C		PASS
VCP	5 points	C		PASS

Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

Reviewer : Justin Zhong

10.RF FIELD STRENGTH SUSCEPTIBILITY TEST

10.1.Block Diagram of Test Setup



10.2.Test Standard

EN 61547:2009 (EN 61000-4-3:2006+A2:2010 Severity Level: 2, 3V/m)

10.3.Severity level and Performance criterion

10.3.1. Severity level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X.	Special

10.3.2. Performance criterion : A

10.4.EUT Configuration on Test

The test must be used to find severity level in different phrase performance criterion during RF field strength susceptibility test.

The configuration of EUT is same as used in RF field strength susceptibility test.

10.5. Operating Condition of EUT

- 10.5.1. Setup the EUT as shown on Section 10.1.
- 10.5.2. Turn on the power of all equipments.
- 10.5.3. Let the EUT work in test mode (ON) and measure it and test it.

10.6. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor the EUT. All the scanning conditions are as follows :

Condition of Test	Remarks
1. Fielded Strength	3 V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80 MHz-6.0 GHz
4. Sweeping time of radiated	0.0015 decade/s
5. Dwell Time	1 Sec.

10.7. Test Results

PASS

Please refer to the following page.

RF Field Strength Susceptibility Test Results

Beide (Shenzhen) Product Service Limited

Date: May 25,2020

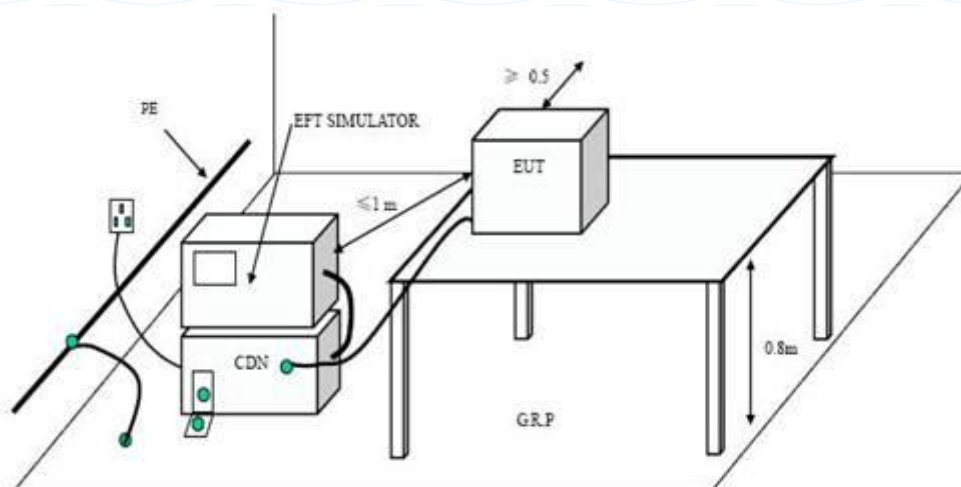
Applicant	: Guangdong Liangyueliang Photoelectric Technology Co.,Ltd	Test Date	: May 25,2020
EUT	: Ballast	Temperature	: 24℃
M/N	: LYL-Y7-800-150W	Humidity	: 49%
Test Engineer	: Jack	Test Mode	: ON
		Frequency Range	: 80 MHz-6.0 GHz
Modulation:	<input checked="" type="checkbox"/> AM	<input type="checkbox"/> Pulse	<input type="checkbox"/> none 1 kHz 80%
Criterion	: A		
	Frequency Range: 80 MHz-6.0 GHz		
Steps	1%		1%
	Horizontal		Vertical
Front	Pass		Pass
Right	Pass		Pass
Rear	Pass		Pass
Left	Pass		Pass

Reviewer :

Austin Zhang

11.ELECTRICAL FAST TRANSIENT/BURST TEST

11.1.Block Diagram of Test Setup



11.2.Test Standard

EN 61547:2009 (EN 61000-4-4:2012)
Severity Level 2 at 1kV

11.3.Severity Levels and Performance Criterion

11.3.1. Severity level

Level	Open Circuit Output Test Voltage $\pm 10\%$	
	On Ballast Lines	On I/O (Input/Output) Signal data and control lines
1.	0.5 kV	0.25 kV
2.	1 kV	0.5 kV
3.	2 kV	1 kV
4.	4 kV	2 kV
X	Special	Special

Performance criterion: **B**

11.4.EUT Configuration on Test

The test must be used to find severity level in different phrase performance criterion during EFT test.

The configuration of EUT is same as used in EFT test.

11.5.Operating Condition of EUT

11.5.1. Setup the EUT as shown in Section 11.1.

11.5.2. Turn on the power of all equipments.

11.5.3. Let the EUT work in test mode (ON) and test it.

11.6. Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between the EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

11.6.1. For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

11.6.2. For signal lines and control lines ports:

It's unnecessary to test.

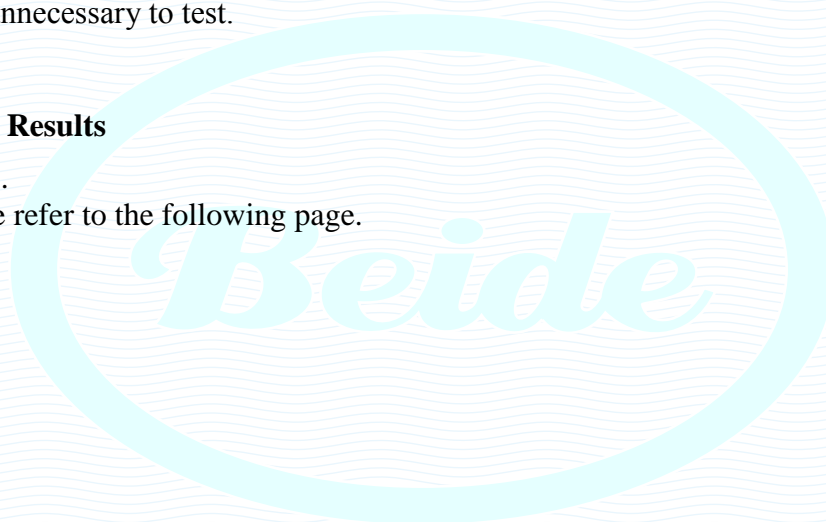
11.6.3. For DC output line ports:

It's unnecessary to test.

11.7. Test Results

PASS.

Please refer to the following page.



Electrical Fast Transient/Burst Test Results

Beide (Shenzhen) Product Service Limited

Date: May 25,2020

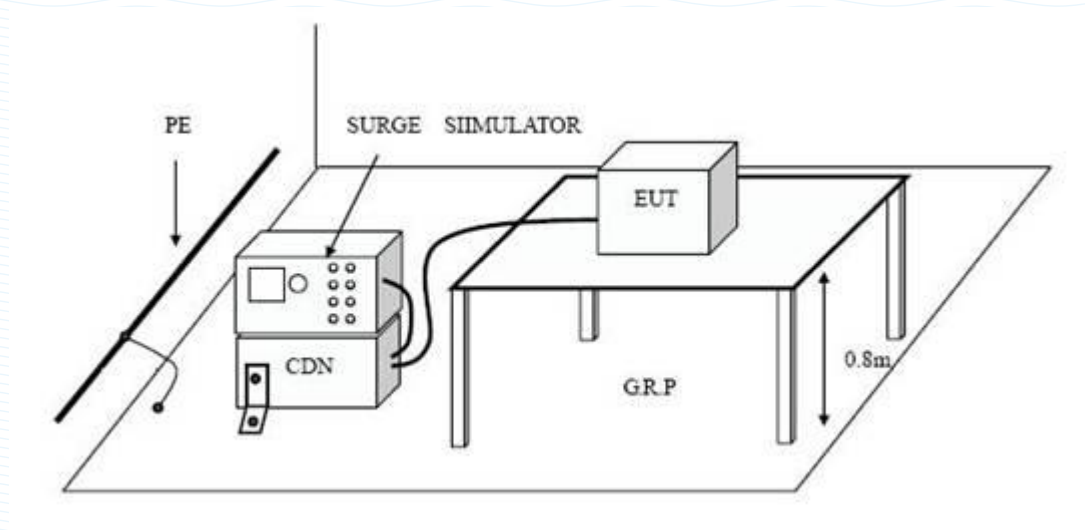
Applicant : <u>Guangdong Liangyueliang Photoelectric Technology Co.,Ltd</u>					Test Date : <u>May 25,2020</u>				
EUT : <u>Ballast</u>					Temperature : <u>24°C</u>				
M/N : <u>LYL-Y7-800-150W</u>					Humidity : <u>49%</u>				
Test Engineer : <u>Jack</u>					Test Mode : <u>ON</u>				
Inject Place : AC Mains									
Inject Line	Voltage kV	Inject Time(s)	Inject Method	Results	Inject Line	Voltage kV	Inject Time(s)	Inject Method	Results
L	±1	120	Direct	PASS					
N	±1	120	Direct	PASS					
L- N	±1	120	Direct	PASS					
Remark:					Test Equipment : Burst Tester(EM TEST)				

Reviewer :

Austin.Zhang

12.SURGE TEST

12.1.Block Diagram of Test Setup



12.2.Test Standard

EN 61547:2009 (EN 61000-4-5:2014)
Severity Level for Line to Neutral: Level 2, 1 kV
Line to Earth: Level 3, 2 kV

12.3.Severity Levels and Performance Criterion

12.3.1. Severity level

Severity Level	Open-Circuit Test Voltage kV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

Performance criterion: C

12.4.EUT Configuration on Test

The test must be used to find severity level in different phrase performance criterion during the test.

The configuration of EUT is same as used in the test.

12.5.Operating Condition of EUT

12.5.1. Setup the EUT as shown in Section 12.1.

12.5.2. Turn on the power of all equipments.

12.5.3. Let the EUT work in test mode (ON) and test it.

12.6. Test Procedure

12.6.1. Set up the EUT and test generator as shown on Section 12.1.

12.6.2. For line to line coupling mode, provide a 1kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points, and for active line / neutral line to ground are same except test level is 2kV.

12.6.3. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.

12.6.4. Different phase angles are done individually.

12.6.5. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

12.7. Test Results

PASS.

Please refer to the following page.

Surge Immunity Test Results

Beide (Shenzhen) Product Service Limited

Date: May 26,2020

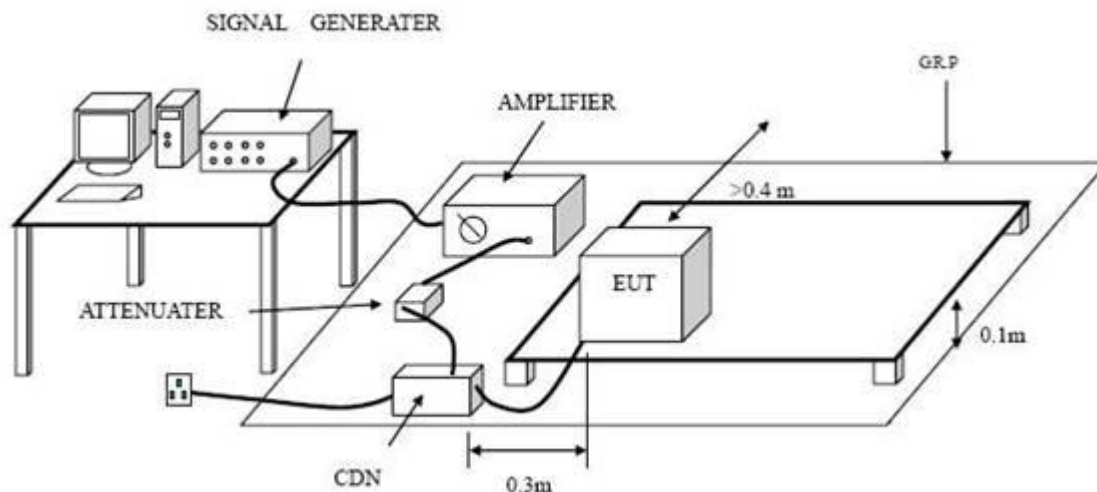
Applicant : Guangdong Liangyueliang Photoelectric Technology Co.,Ltd <hr/> EUT : <u>Ballast</u> <hr/> M/N : <u>LYL-Y7-800-150W</u> <hr/> Test Engineer : <u>Jack</u>	Test Date : <u>May 26,2020</u> <hr/> Temperature : <u>24°C</u> <hr/> Humidity : <u>49%</u> <hr/> Test Mode : <u>ON</u>
--	---

Location	Polarity	Phase Angle	No of Pulse	Pulse Voltage (kV) EN 61000-4-5	Result
L-N	±	0	5	1.0	N/A
	±	90	5	1.0	PASS
	±	180	5	1.0	N/A
	±	270	5	1.0	PASS

Reviewer : Austin Zhong

13. INJECTED CURRENTS SUSCEPTIBILITY TEST

13.1. Block Diagram of Test Setup



13.2. Test Standard

EN 61547:2009 (EN 61000-4-6:2014)
Severity Level 2 at 3V (rms), 0.15MHz ~ 80MHz

13.3. Severity Levels and Performance Criterion

13.3.1. Severity level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

Performance criterion: A

13.4. EUT Configuration on Test

The test must be used to find severity level in different phrase performance criterion during the test.

The configuration of EUT is same as used in the test.

13.5. Operating Condition of EUT

13.5.1. Setup the EUT as shown in Section 13.1.

13.5.2. Turn on the power of all equipments.

13.5.3. Let the EUT work in test mode (ON) and test it.

13.6. Test Procedure

13.6.1. Set up the EUT, CDN and test generators as shown on Section 13.1.

13.6.2. Let the EUT work in test mode and measure it

13.6.3. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and Their height above the ground reference plane shall be between 30 and 50mm (where possible)

13.6.4. The disturbance signal described below is injected to EUT through CDN.

13.6.5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.

13.5.6. The frequency range is swept from 150kHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.

13.6.7. The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the preceding frequency value.

13.6.8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

13.7. Test Results

PASS.

Please refer to the following page.

Injected Currents Susceptibility Test Results

Beide (Shenzhen) Product Service Limited

Date: May 26,2020

Applicant : Guangdong Liangyueliang Photoelectric Technology Co.,Ltd <hr/> EUT : <u>Ballast</u> M/N : <u>LYL-Y7-800-150W</u> Test Mode : <u>ON</u>	Test Date : <u>May 26,2020</u> Temperature : <u>24°C</u> Humidity : <u>49%</u> Test Engineer : <u>Jack</u>
--	---

Frequency Range (MHz)	Injected Position	Strength	Criterion	Result
0.15 ~ 20	AC Line	3V(rms), Unmodulated	A	PASS
20 ~ 80	AC Line	3V(rms), Unmodulated	A	PASS

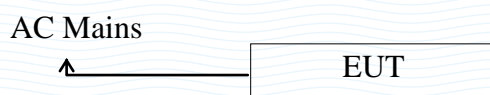
Remark : 1. Modulation Signal:1kHz 80% AM 2. Standard Applied : EN61000-4-6:2014	Note:
---	-------

Reviewer : Justin Zhang

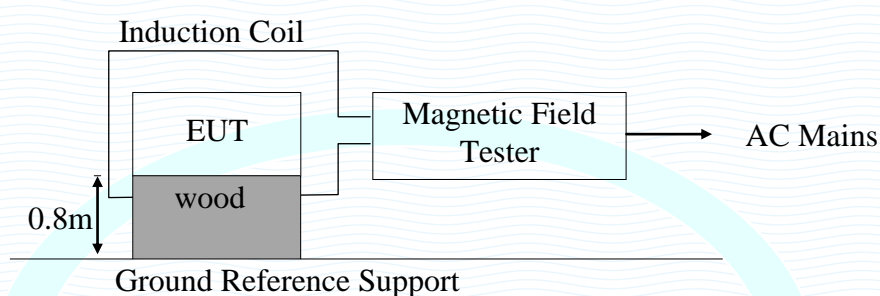
14. MAGNETIC FIELD IMMUNITY TEST

14.1. Block Diagram of Test Setup

14.1.1. Block Diagram of the EUT



14.1.2. Block Diagram of Test Setup



14.2. Test Standard

EN 61547:2009 (EN 61000-4-8:2010)

Severity Level 2 at 3A/m

14.3. Severity Levels and Performance Criterion

14.3.1. Severity level

Level	Magnetic Field Strength A/m
1.	1
2.	3
3.	10
4.	30
5.	100
X.	Special

Performance criterion: A

14.4.EUT Configuration on Test

The test must be used to find severity level in different phrase performance criterion during test.

The configuration of EUT is same as used in the test.

14.5.Operating Condition of EUT

14.5.1. Setup the EUT as shown in Section 14.1.1 and 14.1.2

14.5.2. Turn on the power of all equipments.

14.5.3. Let the EUT work in test mode (ON) and test it.

14.6.Test Procedure

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1m×1m) and shown in Section 14.1.1.and 14.1.2 The induction coil shall then be rotated by 90 ° in order to expose the EUT to the test field with different orientations

14.7.Test Results

PASS.

Please refer to the following page.

Magnetic Field Immunity Test Results

Beide (Shenzhen) Product Service Limited

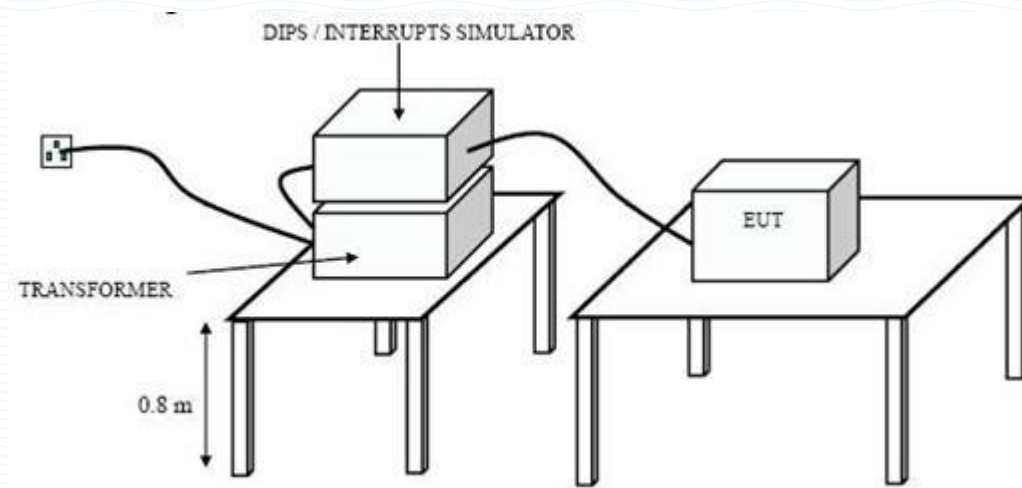
Date: May 26,2020

Applicant : Guangdong Liangyueliang Photoelectric Technology Co.,Ltd <hr/> EUT : <u>Ballast</u> <hr/> M/N : <u>LYL-Y7-800-150W</u> <hr/> Test Mode: <u>ON</u>			Test Date : <u>May 26,2020</u> <hr/> Temperature : <u>24°C</u> <hr/> Humidity : <u>49%</u> <hr/> Test Engineer : <u>Jack</u>	
Test Level	Testing Duration	Coil Orientation	Criterion	Result
3A/m	5 mins	X	A	PASS
3A/m	5 mins	Y	A	PASS
3A/m	5 mins	Z	A	PASS
Remark:			Test Equipment : Magnetic Field Tester EM TEST	

Reviewer : Austin Zhang

15.VOLTAGE DIPS AND INTERRUPTIONS TEST

15.1.Block Diagram of Test Setup



15.2.Test Standard

EN 61547:2009 (EN 61000-4-11:2004)

15.3.Severity Levels and Performance Criterion

15.3.1. Severity level

Test Level %U _T	Voltage dip and short interruptions %U _T	Duration (in period)
0	100	0.5 1
40	60	5 10
70	30	25 50 *

Performance criterion: **C & B**

15.4.EUT Configuration on Test

The test must be used to find severity level in different phrase performance criterion during test.

The configuration of EUT is same as used in the test.

15.5.Operating Condition of EUT

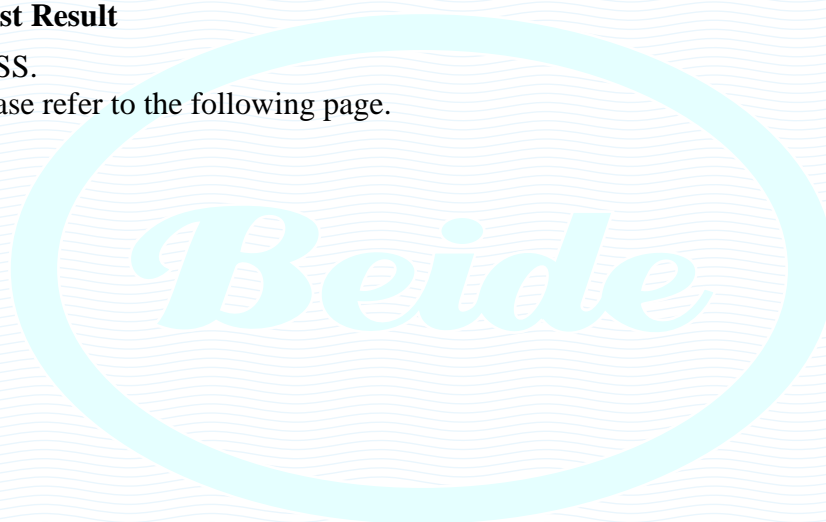
- 15.5.1. Setup the EUT as shown in Section 15.1.
- 15.5.2. Turn on the power of all equipments.
- 15.5.3. Let the EUT work in test mode (ON) and test it.

15.6.Test Procedure

- 1) Set up the EUT and test generator as shown on Section 15.1.
- 2) The interruptions are introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.

15.7.Test Result

PASS.
Please refer to the following page.



Voltage Dips And Interruptions Test Results

Beide (Shenzhen) Product Service Limited

Date: May 26,2020

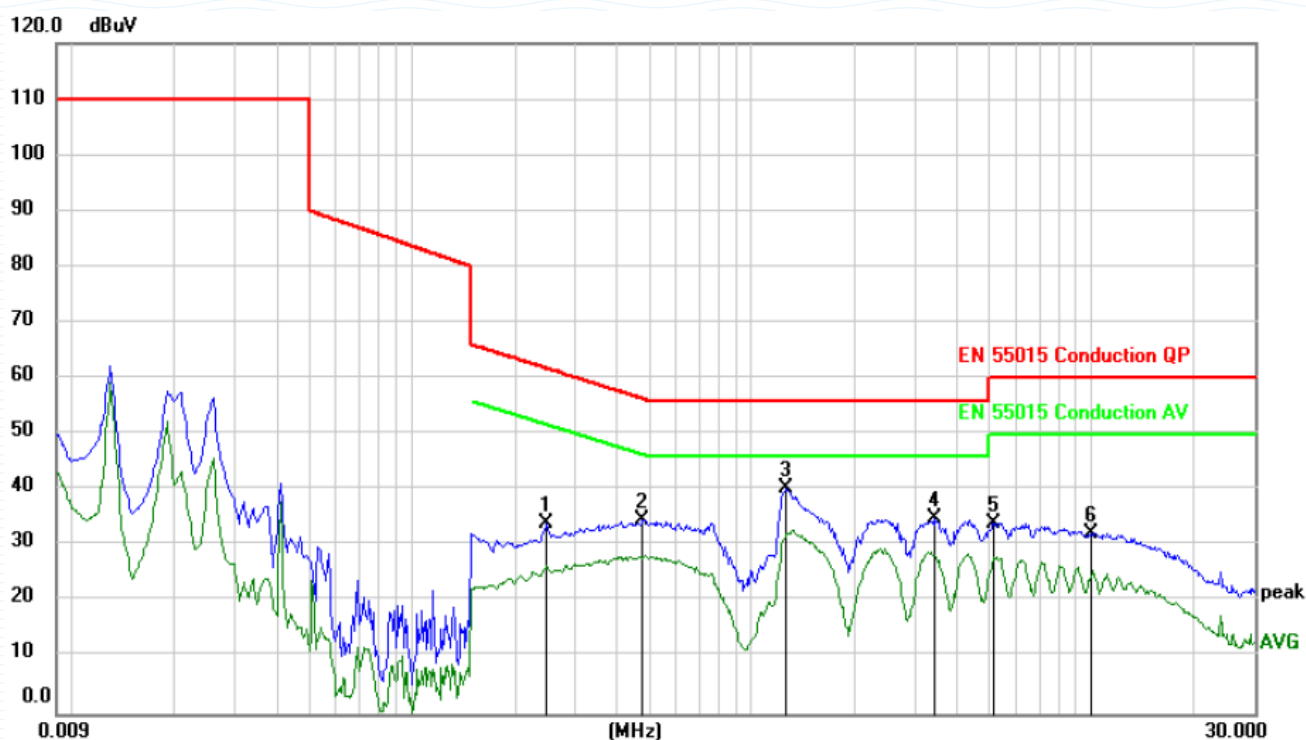
Applicant : Guangdong Liangyueliang Photoelectric Technology Co.,Ltd			Test Date : <u>May 26,2020</u>		
EUT : <u>Ballast</u>			Temperature : <u>24°C</u>		
M/N : <u>LYL-Y7-800-150W</u>			Humidity : <u>49%</u>		
Test Mode: <u>ON</u>			Test Engineer : <u>Jack</u>		
Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in period)	Phase Angle	Criterion	Result
70	30	10P	90°	C	PASS
0	100	0.5P	180°	B	PASS
Remark: U _T is the rated voltage for the equipment.			Test Equipment : Main Interference Simulator (EM TEST)		

Reviewer : Austin Zhong

**APPENDIX I
(TEST DATA)**

Beide

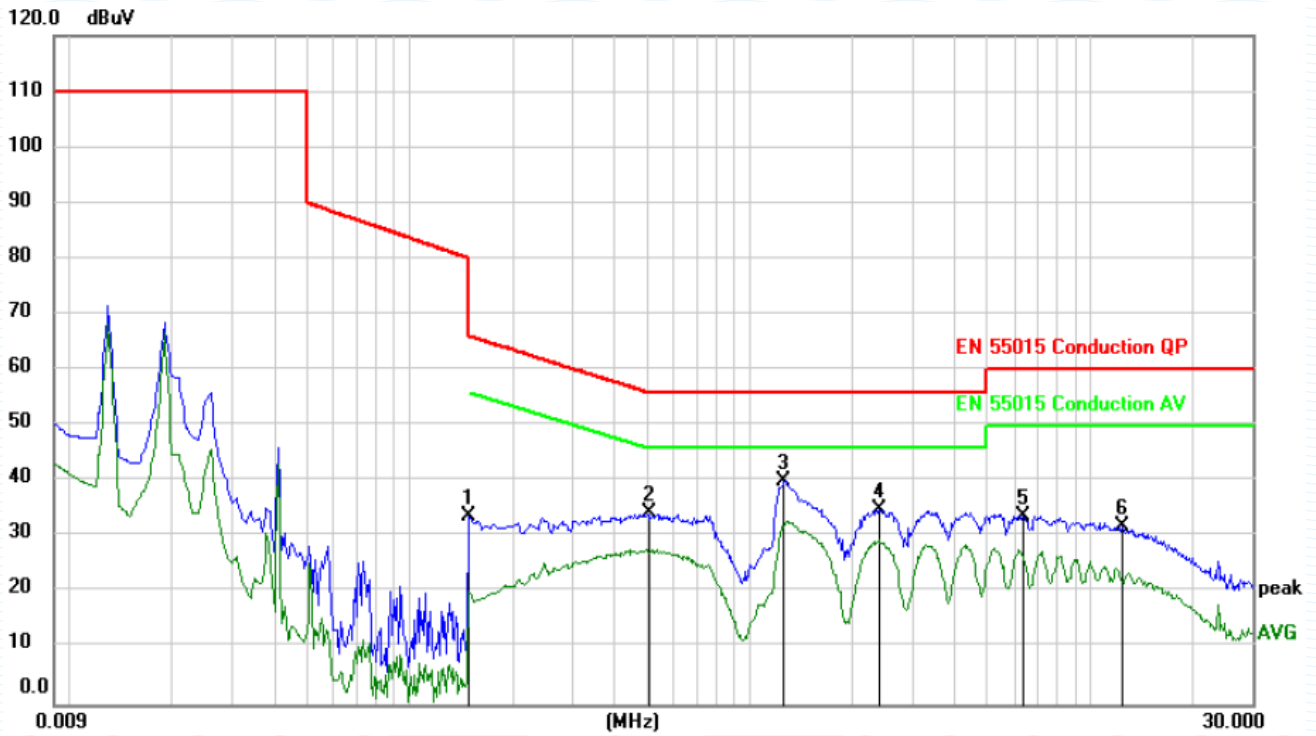
Job No.:		Polarization:	Neutral
Standard:	EN 55015	Power Source:	AC 230V
Test item:	Conduct Test	Date:	2020/05/27
Temp.(°C)/Hum.(%RH):	24°C/47%RH	Time:	
EUT:	Ballast	Test By:	
Model:	LYL-Y7-800-150W	Distance:	
Note:			



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.2490	23.81	10.11	33.92	61.79	-27.87	peak	
2		0.4785	24.35	10.24	34.59	56.37	-21.78	peak	
3	*	1.2605	29.85	10.42	40.27	56.00	-15.73	peak	
4		3.4405	24.31	10.53	34.84	56.00	-21.16	peak	
5		5.1405	23.51	10.64	34.15	60.00	-25.85	peak	
6		9.9405	21.48	10.82	32.30	60.00	-27.70	peak	

Job No.:		Polarization:	Line
Standard:	EN 55015	Power Source:	AC 230V
Test item:	Conduct Test	Date:	2020/05/27
Temp.(°C)/Hum.(%RH):	24°C/47%RH	Time:	
EUT:	Ballast	Test By:	
Model:	LYL-Y7-800-150W	Distance:	

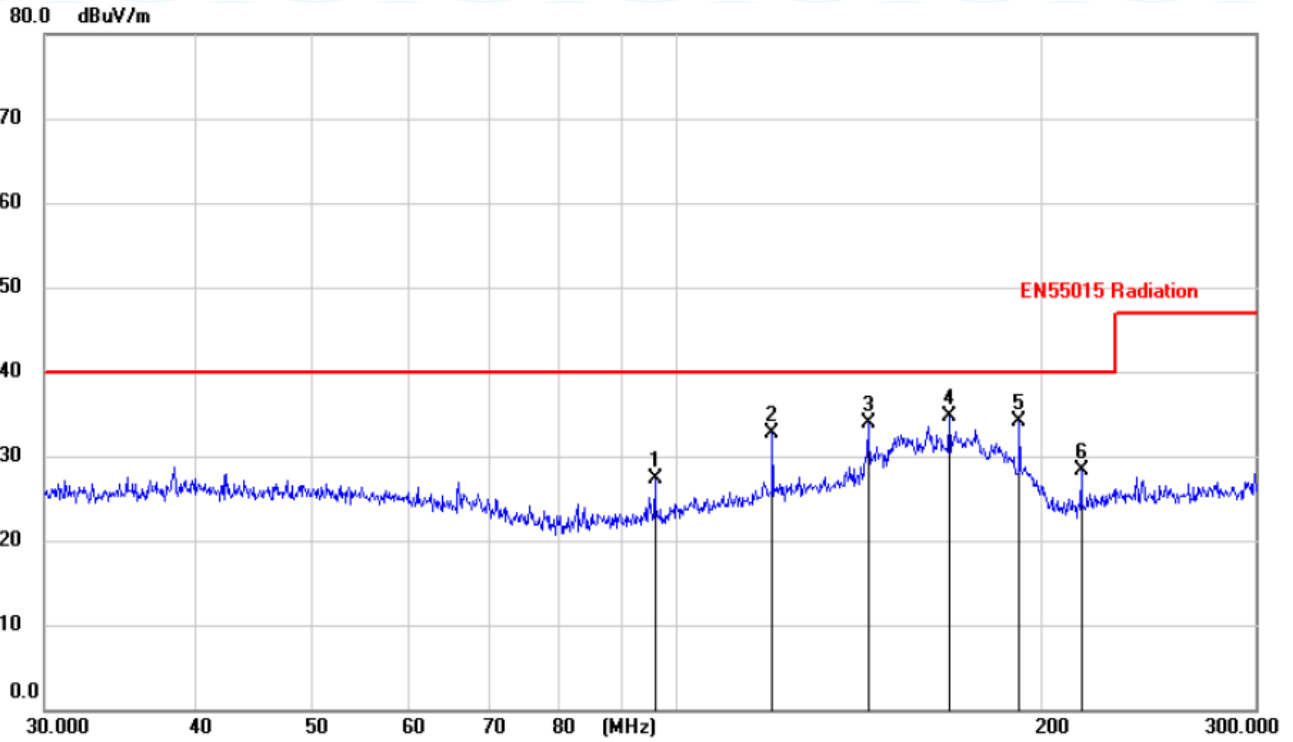
Note:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1500	23.57	10.07	33.64	66.00	-32.36	peak	
2		0.5055	23.93	10.27	34.20	56.00	-21.80	peak	
3	*	1.2605	29.49	10.42	39.91	56.00	-16.09	peak	
4		2.4005	24.42	10.44	34.86	56.00	-21.14	peak	
5		6.3805	23.06	10.69	33.75	60.00	-26.25	peak	
6		12.4205	20.94	10.88	31.82	60.00	-28.18	peak	

Job No.:		Polarization:	Horizontal
Standard:	EN 55015	Power Source:	AC 230V
Test item:	Radiation Test	Date:	2020/05/27
Temp.(°C)/Hum.(%RH):	24°C/47%RH	Time:	
EUT:	Ballast	Test By:	
Model:	LYL-Y7-800-150W	Distance:	3m

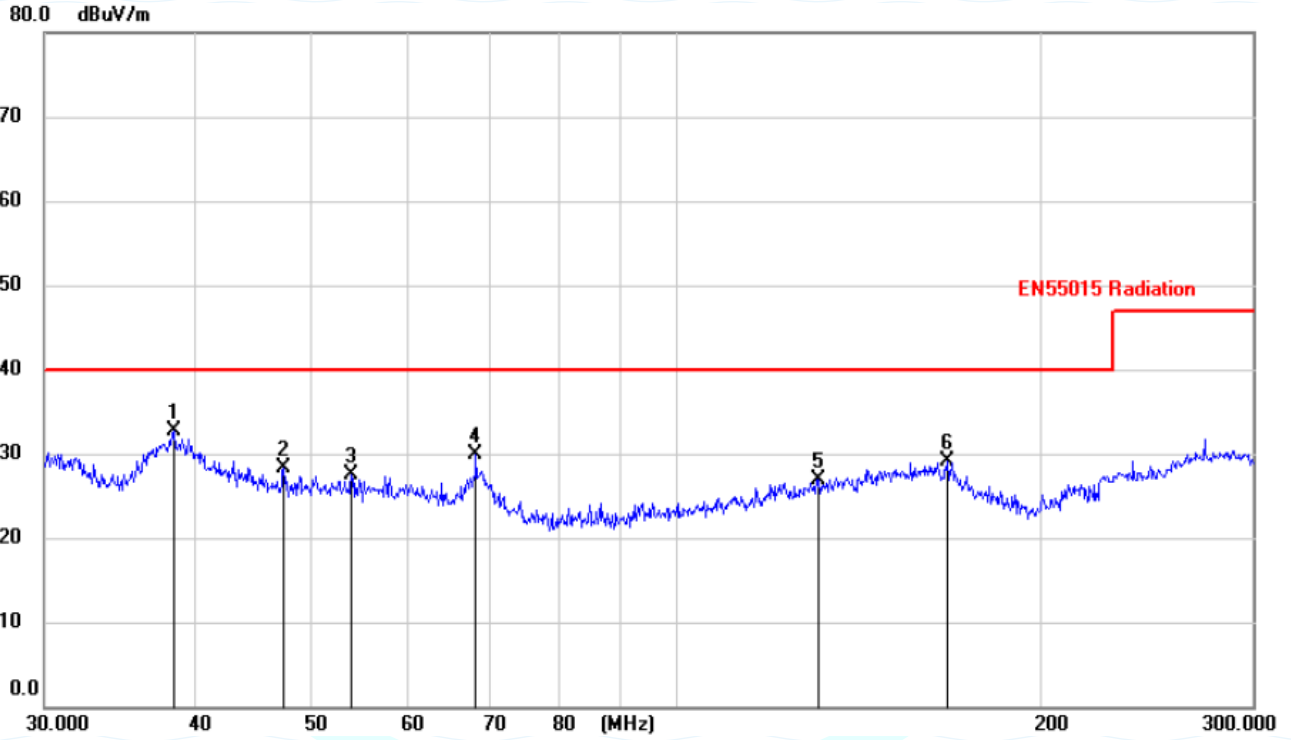
Note:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Antenna Height cm	Table Degree degree	Comment
1		95.8840	17.12	10.27	27.39	40.00	-12.61			peak
2		119.8798	20.04	12.59	32.63	40.00	-7.37			peak
3		143.8786	19.80	14.11	33.91	40.00	-6.09			peak
4	*	167.8306	20.82	13.95	34.77	40.00	-5.23			peak
5		191.8100	23.28	10.82	34.10	40.00	-5.90			peak
6		215.7725	17.32	11.05	28.37	40.00	-11.63			peak

Job No.:		Polarization:	Vertical
Standard:	EN 55015	Power Source:	AC 230V
Test item:	Radiation Test	Date:	2020/05/27
Temp.(°C)/Hum.(%RH):	24°C/47%RH	Time:	
EUT:	Ballast	Test By:	
Model:	LYL-Y7-800-150W	Distance:	3m

Note:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	38.3814	18.67	13.96	32.63	40.00	-7.37			peak
2		47.4101	14.62	13.68	28.30	40.00	-11.70			peak
3		53.9505	14.03	13.43	27.46	40.00	-12.54			peak
4		68.3512	18.45	11.36	29.81	40.00	-10.19			peak
5		130.9924	13.58	13.29	26.87	40.00	-13.13			peak
6		167.8306	15.07	13.95	29.02	40.00	-10.98			peak

**APPENDIX II
(EUT PHOTO)**

Beide

Figure 1
POWER LINE CONDUCTED TEST OF EUT

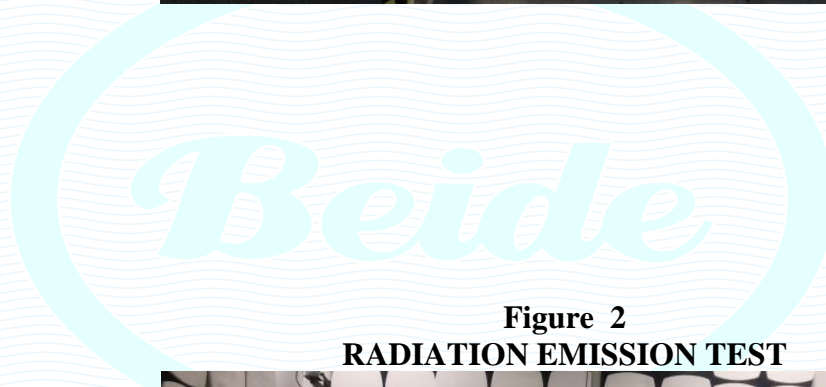


Figure 2
RADIATION EMISSION TEST

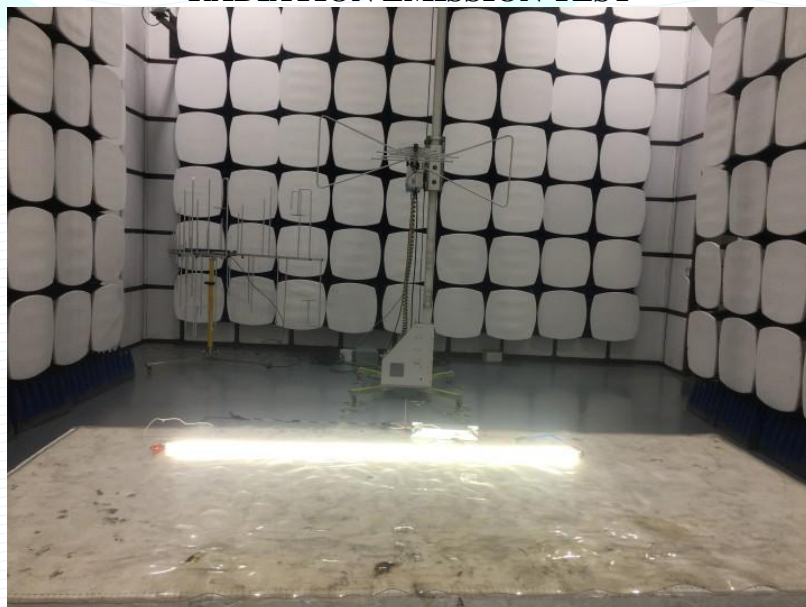


Figure 3
Harmonic Current Test

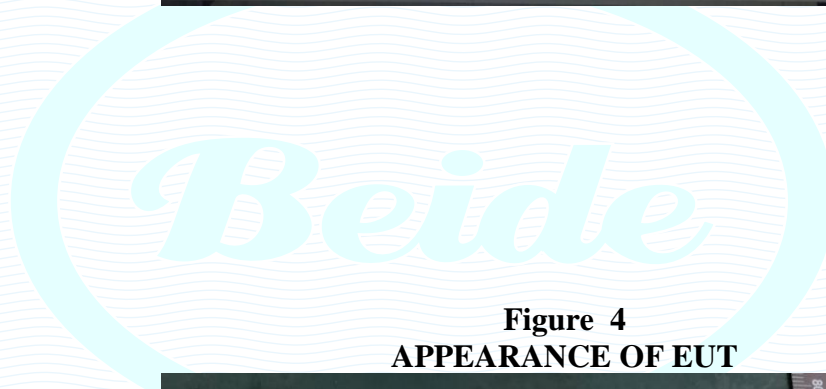


Figure 4
APPEARANCE OF EUT

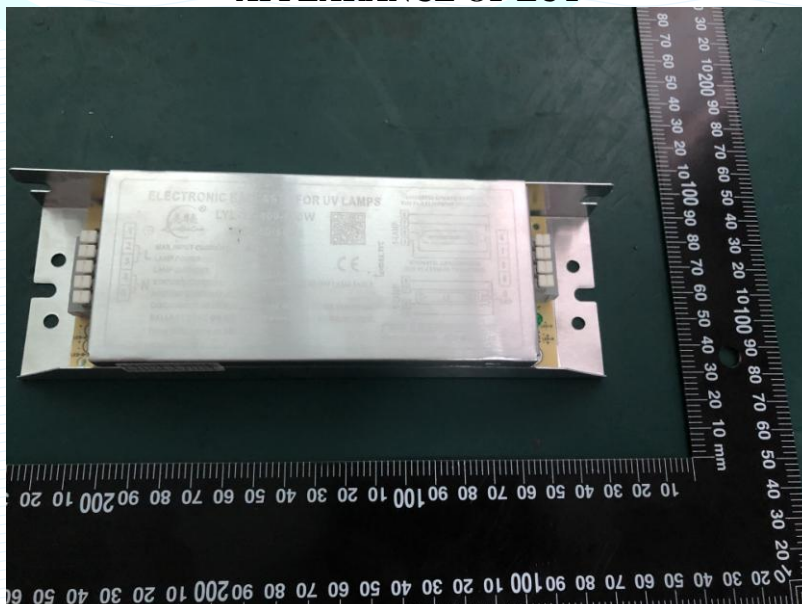


Figure 5
APPEARANCE OF EUT

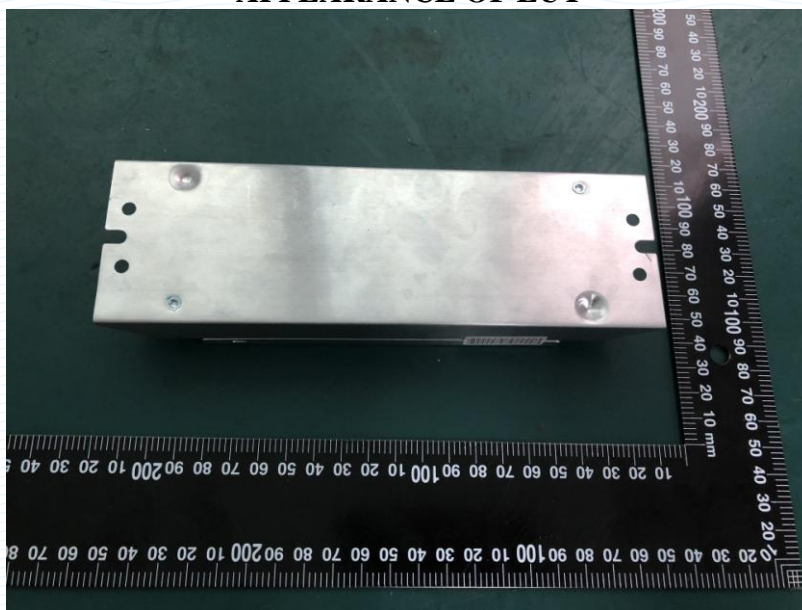


Figure 6
APPEARANCE OF EUT

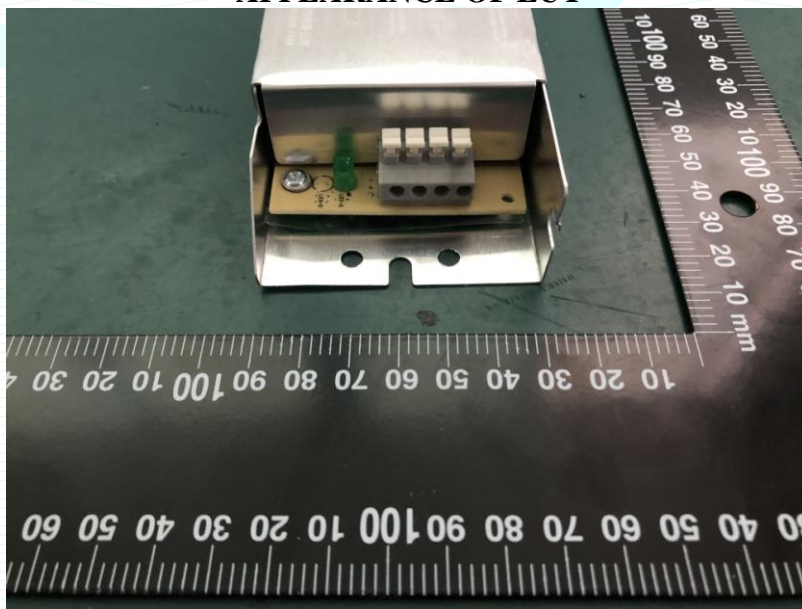


Figure 7
APPEARANCE OF EUT

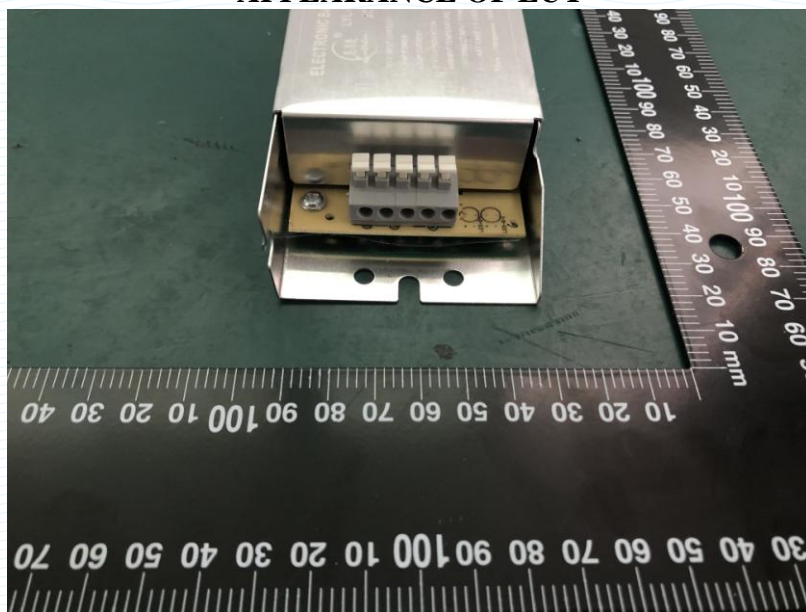


Figure 8
APPEARANCE OF EUT

